WG-1 / WG-6 Intent Proposal Summary

- Implements Target State Reports
  - Target Altitude: Current or Next Level-Off Altitude
  - Target Heading / Track: Current Target Direction
  - Includes validity, source and mode indicators

- New TCP def'n: includes 4D TCP's and target alt if change point

- New Trajectory Change Reports
  - Includes Altitude Constraints, e.g. AT, AT and Above/Below
  - Includes flight segment parameters and endpoint TCP's
  - Up to four TCP's ordered by Active / Planned and time
  - Includes TCP type, validity and active / planned bits

Target State Report Format

- 1 Target Altitude
- 2 Target Heading/Track
- 3 Heading/Track Indicator
- 4 Target Source Indicator (Horizontal)
- 5 Target Source Indicator (Vertical)
- 6 Mode Indicator (Horizontal)
- 7 Mode Indicator (Vertical)
- 8 *Validity Bit (Horizontal)
- 9 *Validity Bit (Vertical)

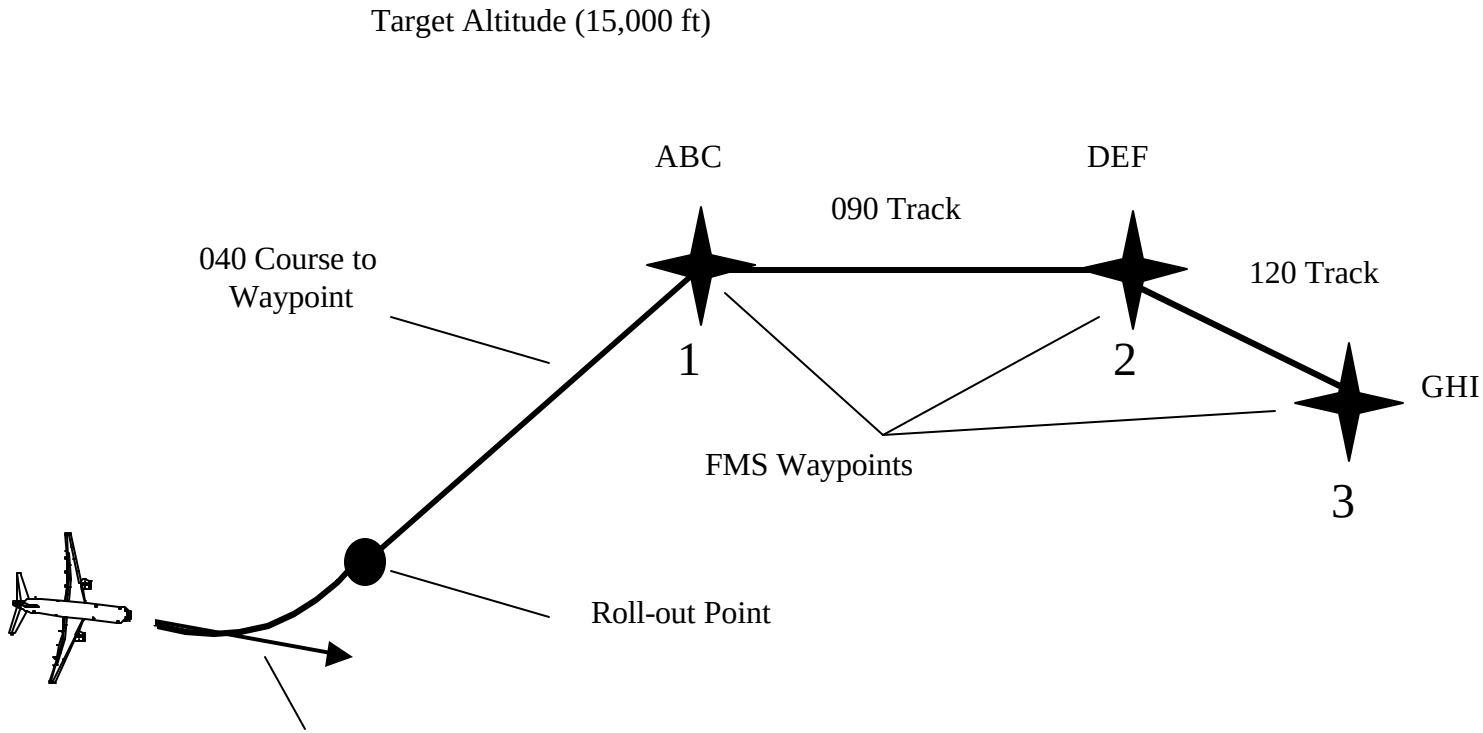
Example Format: MCP Climb at Constant Heading

Element #	Contents
1	8,000 ft
2	090 deg
3	Heading
4	MCP/FCU
5	MCP/FCU
6	Maintaining
7	Acquiring
8	*
9	*

Trajectory Change Report Format

Element #	Contents
1	Latitude
2	Longitude
3	Altitude
4	Time to Go (TTG)
5	Altitude Constraint Type
6	Altitude Constraint Validity
7	Turn Radius
8	Track to TCP
9	Track from TCP
10	TCP Type (Horizontal)
11	TCP Type (Vertical)
12	*TCP Validity (Horizontal)
13	*TCP Validity (Vertical)
14	Active /Planned (Horizontal)
15	Active /Planned (Vertical)

Intercept Course to FMS Flight Plan Example



Trajectory Change Report for FMS Waypoint Example

Element #	Contents (1)	Contents (2)	Contents (3)
1	$Latitude_{ABC}$	$Latitude_{DEF}$	$Latitude_{GHI}$
2	$Longitude_{ABC}$	$Longitude_{DEF}$	$Longitude_{GHI}$
3	15,000 ft	15,000 ft	15,000 ft
4	TTG_ABC	TTG_DEF	TTG_GHI
5	Const. type	Const. type	Const. type
6	NA	NA	NA
7	$Radius_{ABC}$	$Radius_{DEF}$	$Radius_{GHI}$
8	040 deg	090 deg	120 deg
9	090 deg	120 deg	Track from
10	Fly-By Turn	Fly-By Turn	Fly-By Turn
11	Selected Altitude	Selected Altitude	Selected Altitude
12	*	*	*
13	*	*	*
14	Active	Active	Active
15	Active	Active	Active

Deficiencies/Issues in Version 1 Intent White Paper

(First Pass Critique)

- Insufficient justification for intent proposal
  - Why is it important to provide Target Altitude (which is much more difficult to implement than Selected Altitude)?
  - Is it necessary to have so many intent parameters to define current and future flight segments, i.e. are we gilding the lily ? (too much complexity?)
- Explicit definition and interpretation of horizontal / vertical TCP types needed
- Target State and TCP validity bit definitions issue
- Minimum Requirements for Class A2, Class A3 Equipage
- Active / Planned Trajectory Definition

Alternative Trajectory Segment Definitions

- **Command Trajectory –** The path (consecutive flight segments) the aircraft will fly in its current automation state given no further pilot inputs.

- **Active Trajectory** (NASA) – Synonym for command trajectory
- **Active Trajectory** (Alternative) – The horizontal and vertical flight segments currently being flown by the aircraft automation.

- **Planned Trajectory** (NASA) – The path which is planned in the aircraft automation system that is not part of the command trajectory.
- **Planned Trajectory** (Alternative) – The path (series of consecutive flight segments) which is defined by a sequence of TCP's with specified end times, following the Active segments

- **What is Best Definition for Purposes of ADS-B MASPS?**

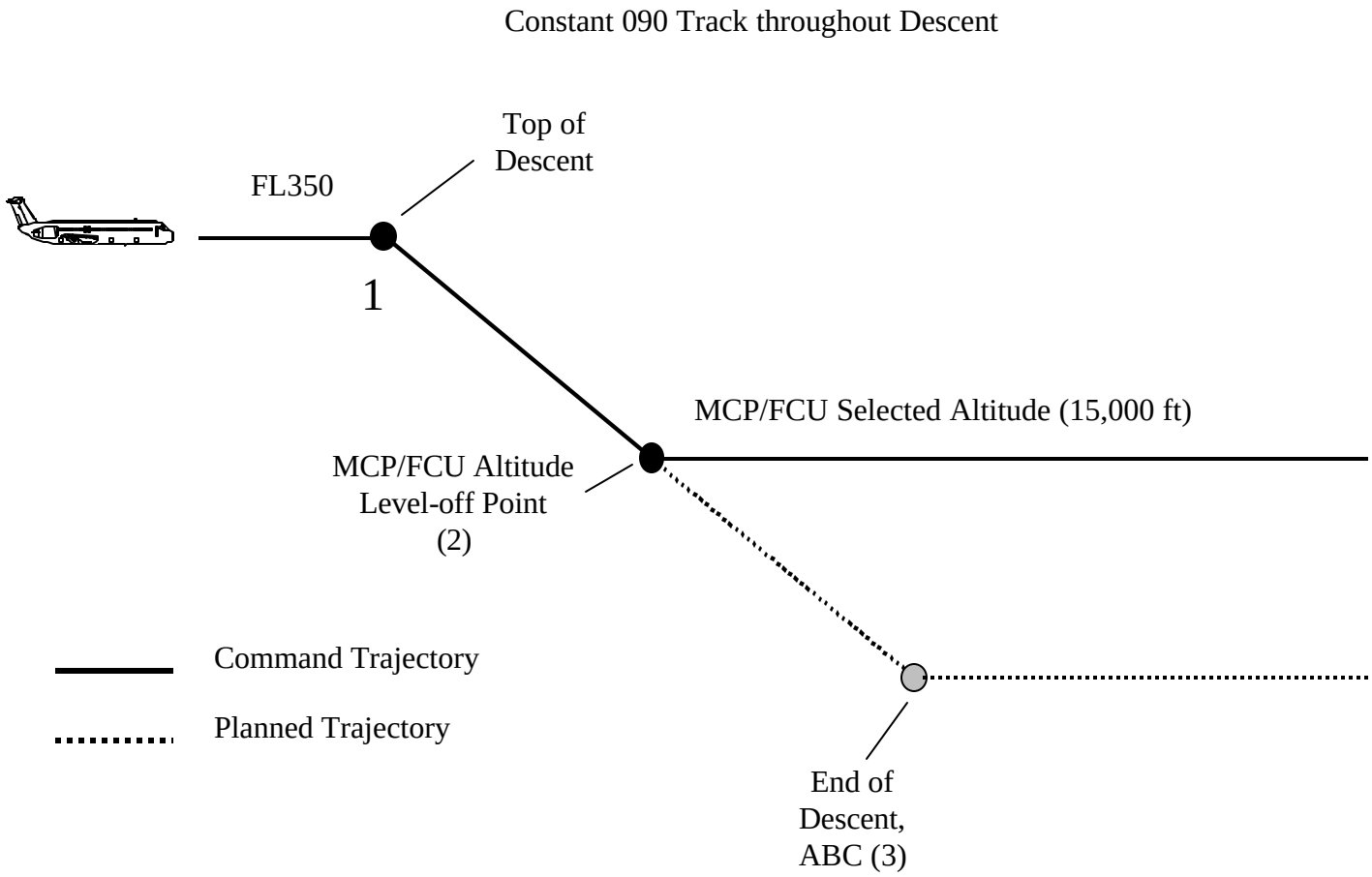
Potential Uses of Command and Planned Trajectories

- Command Trajectories / TCP's –
  - Tactical intervention when planned trajectory is no longer feasible, e.g. clearance altitude, vectoring, go-around
  - Back-up for unforeseen circumstances, e.g. Missed Approach procedure
  - Command Trajectories are preferred option for Separation Assurance applications, e.g. minimize risk of separation conflict

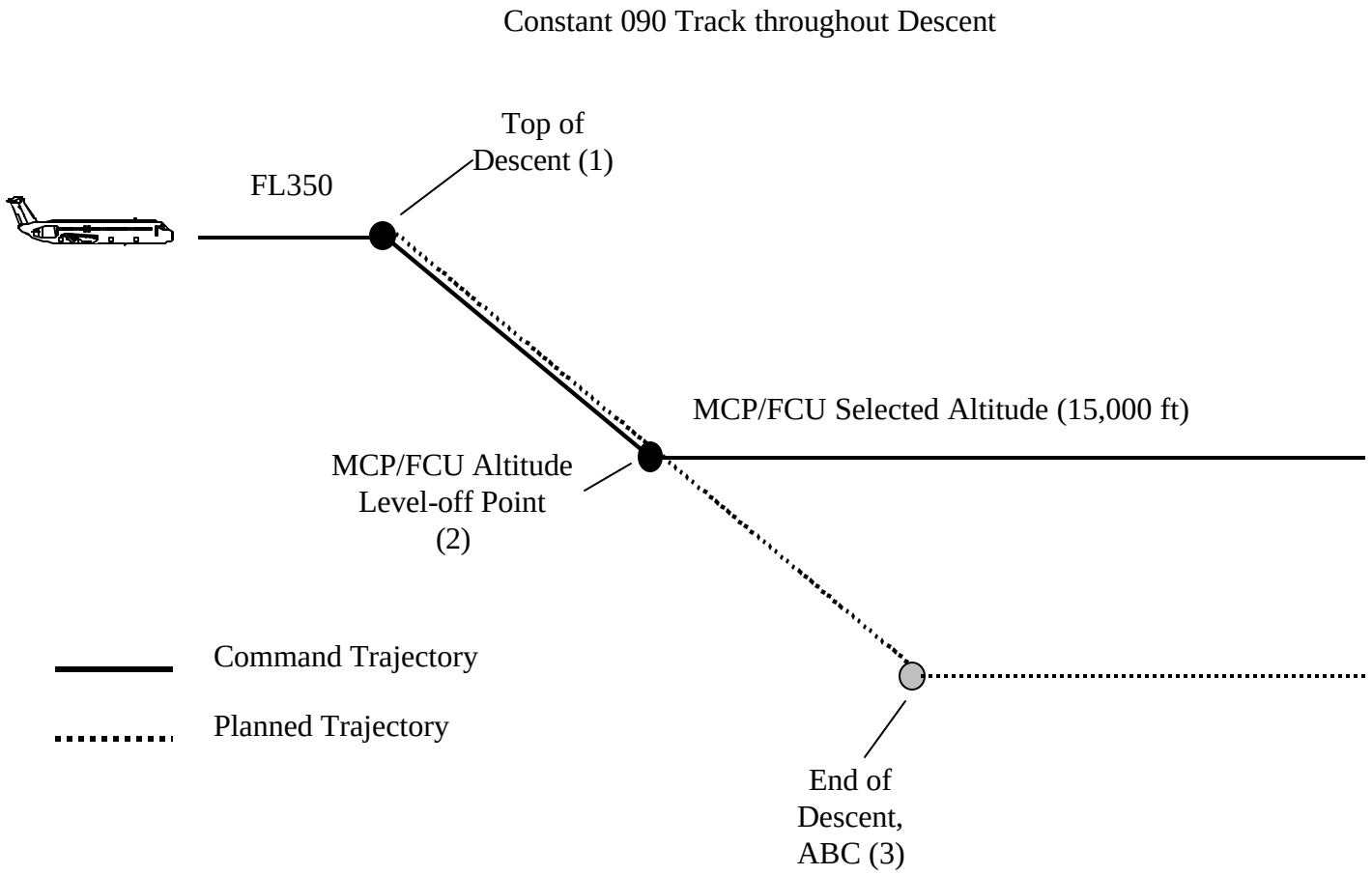
- Planned Trajectories / TCP's –
  - Provide information on probable long term path for planning purposes, e.g. aircraft sequencing at terminal meter-fix
  - Contain only finite length flight segments , e.g. ignore selected altitude, altitude hold, heading hold indefinite segments
  - Planned trajectories are preferred option for non-critical planning applications where probable path and timing is sufficient for decision making

Command and Planned Trajectory Example

(NASA Definition)



Command and Planned Trajectory Example
(Alternative Definition)



Note: Command Trajectory is defined by TCP's 1 and 2, Planned Trajectory is defined by TCP's 1 and 3